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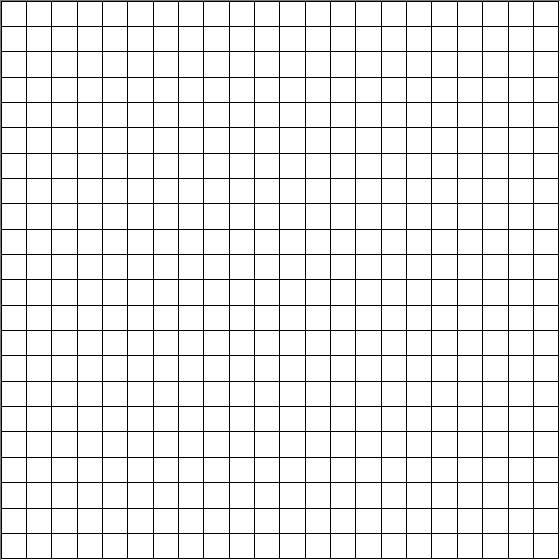
**Determining the Solute Concentration of a Potato Cell**

Ms. Ottolini, AP Biology

**Background Information:** Potato cores placed in sucrose solutions at 27°C resulted in the following percent changes after 24 hours:

|  |  |
| --- | --- |
| **% Change in Mass** | **Sucrose Molarity** |
| 20.0% | Distilled water |
| 10.0% | 0.2 M |
| -3.0% | 0.4 M |
| -17.0% | 0.6 M |
| -25.0% | 0.8 M |
| -30.0% | 1.0 M |

1. Graph the results on the grid given below. Give your graph a title with the format: “The Effect of \_\_\_\_\_\_\_ on \_\_\_\_\_\_\_.” Make sure to label your axes.



1. Estimate the molar concentration of sucrose within the potato cells using the graph above. How did you obtain your answer?
2. Calculate the solute potential of sucrose inside the potato cells using the formula given below. Remember, sucrose does not break apart in water. (This will help you determine the ionization constant, i) Assume that the potato cells are at room temperature (298 K).

**Ψs = -iCRT**

1. Is the water potential in the potato cells higher or lower than the water potential in the 0.2 M sucrose solution? How do you know?
2. Is the water potential in the potato cells higher or lower than the water potential in the 0.4 M sucrose solution? How do you know?